WORK SELF-EFFICACY OF INDIVIDUALS INJURED ON THE JOB

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Abstract

Each year thousands of individuals are injured on the job. With effective medical treatment, musculoskeletal injuries heal and most individuals returned to work; however, some do not make the transition from medical treatment back to work. Through self-efficacy theory Bandura's (1977) postulates that individuals maintain considerable influence over the outcome of their experience based on their self-perceptions. However, research is lacking on whether individuals with higher levels of work self-efficacy are more likely to return to work sooner following an injury than individuals with lower levels of work self-efficacy. Therefore, through this exploratory research, the Return to Work Self-Efficacy Scale was developed and tested through in-person interviews with a convenience sample of 19 participants who were injured on the job; were in receipt of Workers' Compensation benefits; and were attending their final treatment at an Occupation Rehabilitation Program, Canadian Back Institute. Analysis revealed that individuals with a high level of work self-efficacy, also presented with a high level of coping with pain self-efficacy, a high level of physical function self-efficacy, a high level of coping with symptoms self-efficacy. These individuals were more likely to return to work following injury than their lower level of self-efficacy counterparts. The research concludes with recommendations for further study.

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CHAPTER ONE INTRODUCTION

Background

Each year in British Columbia (BC) 3301 workers receive muscle or skeleton (musculoskeletal) injuries and file claims for workers' compensation benefits (Workers' Compensation Board, 2003). The immediate consequence of a musculoskeletal injury is tissue damage and pain; however, through effective medical treatment musculoskeletal injuries heal, but pain may take longer to resolve (Cocchiarella & Andersson, 2000). The ramifications of pain are a substantial, multifaceted, social, health care problem with far reaching implications for the sufferer's family, friendships, lifestyle, work, and economic well being (American Medical Association, 2001; Harrison, Watson, & Feinmann, 1997; Pearce, & Erskin, 1993; Puder, 1988; Subramaniam, Malcolm, & Smith, 1999). Moreover, the direct effect of pain on the injured individuals may include depression, feelings of helplessness, anger, frustration, and social isolation, which makes coping with pain and returning to work extremely difficult (Pearce & Erskin, 1993).

Aside from the WCB claim related statistics, Akyeampong (as cited in Dyck, 2000) reported that in 1999 Canadian employers experienced 72 million days of lost time due to employees' illness or injury resulting in $37.4 billion direct health care cost. Similarly, in the United States back pain in particular results in billions of dollars in medical costs, lost time and production from work and is the single greatest reason for health care access (Cole, 1998; Langelier & Gallagher, 1989). Approximately 10-15% of adult working individuals experience some level of disabling back pain yearly (Osterweis, Kleiman, & Mechanic, 1987). Indeed, low back pain and other

musculoskeletal conditions such as joint pain, arthritis and rheumatism are the leading causes of disability in the working population.

Although pain is a significant health care problem, most of the 3301 individuals injured on the job in BC returned to work following their treatment. Treatment may have included diagnostic imaging, surgery, pharmacology, physiotherapy, occupational rehabilitation, medical rehabilitation, pain clinic and graduated return to work (W. Clifford, personal communication, November 12, 2002). The high return to work rate suggests that the majority of individuals with musculoskeletal injuries and associated pain are able to cope and continue to live productive meaningful lives and return to work. However, for unknown reasons, some individuals experience the downward spiral of the pain cycle and fail to make the transition from medical treatment back to work. Osterweis, Kleiman, and Mechanic (1987) noted that disability is complex. An individual's judgment on whether the individual can return to work following injury is influenced by somatic features including anatomy and physiology, cognitive and psychological circumstance, education, social situations, work experience as well as available work. Clearly, the individual's transition from medical treatment to work is affected by factors that lie outside the domain of the medical model and anatomical recovery.

Theory

Osterweis, Kleiman, and Mechanic's (1987) identification of factors that influence individual's perceptions of whether they can return to work raise concerns for the eventual success of individual's transition from medical treatment to work. Of primary concern is the lack of a systematic method to evaluate how the individual's

injury has affected their perception of their ability to return to work. What internal control does the individual bring to bear on their judgment about whether the individual can return to work? Bandura (1977) postulated, through self-efficacy theory, that individuals maintain considerable influence over their experiences depending on self-perception, outcome expectations, and self-efficacy expectations. Although outcome expectation and self-efficacy expectation are inextricably associated, they differ substantially from one another. In essence, outcome expectation is the conclusion one has drawn that a specific behavior will lead to a predicted outcome. On the other hand, self-efficacy expectation is the assurance the individual holds that the individual is capable of performing the required behaviors to produce the expected outcome. However, although one concludes that certain actions or behaviors will result in specific outcomes, the individual must believe that they are capable of performing the activity, otherwise, the individual's behavior will not be affected (Bandura 1977). In other words, the individual must have knowledge of the required behavior that is required to reaching a given outcome, and the individual must believe that he or she is capable of performing the behavior.

Four principal sources of information are fundamental to self-efficacy expectation and outcome expectation. These sources of information included performance attainment, vicarious experiences, verbal persuasion, and emotional arousal or physiology state (Bandura 1977). Bandura (1977) theorized that because performance attainment is based on authentic mastery experience, it is the most influential source of efficacy information. The relative weight one attaches to a new experience is dependent on one's earlier self-efficacy perception into which the experience must be integrated.

On the other hand, vicarious experience is also a source of self-efficacy information. An individual observes others' behaviors and learns that the others' behavior resulted in a positive or a negative outcome. Consequently, observers increase their expectation that they could or could not improve in the observed behaviors if they persisted in their efforts (Bandura 1977). Although vicarious experiences are generally weaker than direct experiences, vicarious sources of information can produce significant enduring changes in expectation of personal efficacy.

Like vicarious experience, verbal persuasion, the third major source of information, is not based on authentic mastery experience. Rather, verbal persuasion is used to convince another to believe that the individual possess the capabilities that will enable the individual to achieve what the individual seek. Social persuasion alone may be limited in its power to create enduring increase in self-efficacy, but it can contribute to successful performance if the heightened appraisal is within realistic bounds (Bandura 1977). Individuals who are verbally persuaded that they posses the capabilities to master given tasks are likely to mobilize greater sustained effort than if they harbour self doubts and dwell on personal deficiencies when difficulties arise.

Unlike the previous three major sources of information, emotional arousal provides the individuals' with somatic feedback on their physiological state. Emotional arousal could include stress, fear, anxiety, or any anticipatory response. In turn, this emotional arousal provides important information to individuals that influence their judgments about their ability to attain a given end. An emotional response of fear or agitation may be interpreted as ominous and a sign of pending dysfunction. Bandura (1977) theorized that fear and agitation are generally inhibitors to performance. Methods

that one can employ to reduce self-imposed emotional arousal can raise the level of perceived self-efficacy with concurrent improvement in performance.

Although outcome expectation and self-efficacy expectation affects individual's behavioral choices, psychological influences create and strengthen one's expectation of personal efficacy. Perceived self-efficacy refers to individuals' "judgments of their capability to organize and execute courses of action required to attain a designated type of performance. However, self-efficacy is not concerned with the skills one has but with the judgments of what one can do with whatever skills one possesses" (Bandura, 1986, p. 391). Perception of one's self-efficacy beliefs influences personal choices, eventual success, and coping ability. In other words, to judge that one is capable of a given course of action, one must perceive that one has the necessary skills. Moreover, an individual must receive incentives in order to expend and sustain the required effort to obtain a given end or deal with stressful situations (Bandura, 1977). Self-efficacy involves the coordination and organization of cognition, social and behavioral sub skills to meet a variety of purposes. Initial success is not guaranteed; rather, one must test alternative behavioral strategies. Those who are persistent succeed, whereas self-doubters often abort their initial efforts and give up. Self-efficacy is a significant determinant of performance and operates independently of underlying skills. Self-efficacy theory is relevant to all judgments the individual makes including whether the injured individual believes they can cope with pain, increase their physical function, reduce depression, and return to work. In the following review of the literature, self-efficacy is examined through research of the effects on self-efficacy on return to work individuals' return to work.

Literature Review

Self-efficacy theory has been widely studied. However, this literature review, undertaken on key phrases such as self-efficacy and work, self-efficacy and return to work, self-efficacy and employment, self-efficacy, medical recovery and work, and, self-efficacy and pain control, are under-represented in major data basis including journals, monographs, and dissertation abstracts. No studies were located that directly related to work self-efficacy of individuals who have been injured on the job. However, review of related research revealed several studies dealing with pain and self-efficacy outcome, self-efficacy outcomes and pain treatment, and self-efficacy and impairment. These studies have been grouped and reviewed from the most distantly related to those most closely associated with work self-efficacy.

Pain and self-efficacy outcomes.

Four studies (Cipher & Fernandez, 1997; Dolce, Doleys, Raczynski, Lossie, Poole, & Smith, 1986; Litt, 1988; Rokke, Absi, Lall, & Oswald, 1991) examined participant's ability to cope with pain and to persist at tasks. Although the studies differ in experimental conditions, they all provided participants with varying levels of manipulation of their scores or performances pending completion of self-efficacy retest questionnaires. The substantive findings of these four studies demonstrated the influence performance information, or feedback, had on participant's subsequent ability in a variety of tasks ranging from tile matching to self-efficacy expectation for pain tolerance. Self-efficacy expectations appeared to be directly related to outcomes. Litt (1988) demonstrated that participants experienced a significant loss in self-efficacy when they consistently received negative information. The self-efficacy judgments individuals made

about their ability to perform a given task determined their level of performance. Positive feedback and choice of ending an aversive task resulted in the participants persevering. Rokke, Absi, Lall, and Oswald (1991) supported Litt's finding that when participants were consistently provided negative information on their performance, following pain control tolerance experience, the participants expectation of pain tolerance in subsistent trials declined. Moreover, in a related study, Litt concluded that participants who believed they had control over stopping the cold pain invoking condition and, who had high control self-efficacy, reported a higher level of self-efficacy and perceived control. Litt reported that choice is an important determinant of improvement in self-efficacy expectation to tolerate aversive conditions. Cipher and Fernandez (1997) were interested in the contribution self-efficacy expectation, response expectancy, and danger expectancy had on pain tolerance and pain avoidance. Cipher and Fernandez (1997) conclusions reinforced the notion that self-efficacy expectations of pain were significantly associated with pain tolerance. However, Cipher and Fernandez revealed that once participants were outside the test condition they avoided the aversive test condition. The researchers did not clarify the level of ongoing daily pain these individuals experienced or whether there was reinforcement to continue. Unlike the other studies, Dolce, Doleys, Raczynski, Lossie, Poole, and Smith (1986) demonstrated that quota or expectation of increasing the time that participants endured a painful stimuli resulted in the desired improvement. Dolce et al. (1986) concluded that pain and discomfort can be managed when individuals judges that they can cope. The foregoing studies demonstrated that individuals' pain coping performance is influenced by the information they received (whether accurate or

fabricated) on their ability in test conditions to tolerate pain and also by choice of pain control technique, and the researchers expectation that the participants are able to cope.

Self-efficacy outcomes of pain treatment.

Pain is the direct outcome of musculoskeletal injury, cancer, or various invasive medical procedures. Six studies (Altmaier, Russell, Kao, Lehmann, & Weinstein, 1993; Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987; Gattuso, Litt, & Fitzgerald, 1992; Jensen, Turner, & Romano, 1991; Kores, Murphy, & Rosenthal, 1990; Lin, 1996), evaluated the effect of participants' pain coping self efficacy. Altmaier, Russell, Kao, Lehmann, & Weinstein's (1993) study on the effects of self-efficacy and outcome of chronic pain treatment reached similar conclusions as Kores, Murphy, and Rosenthal (1990) who researched the impact of coping self-efficacy on pain tolerance. In the former study participants experienced a significant increase in physical functional self-efficacy (range of motion) and pain reduction self-efficacy. The latter study revealed that those with a high level of self-efficacy reported increased improvement in sitting tolerance, but on follow up testing the high self-efficacy group revealed a significant improvement in somatic and verbal pain responses to pain and used less medication. In contrast, Lin (1998) revealed that both cancer and low back pain subjects were similar in self-efficacy expectation and in pain outcomes. Lin (1996) recommended that treatment interventions included pharmacological and non-pharmacological methods. Participants in Jensen, Turner, and Romano's, (1991) study on factors that influenced coping efforts in participant's adjustment to chronic pain seemed to use the pharmacological and non-pharmacological intervention suggested by Lin (1996). Jensen, et al. (1991) reported that the majority of chronic pain participants studied believed that rest and opioid medication

would relieve their pain in the short term and that exercise would exacerbate their pain condition. However, similar to the results of Bandura, O'Leary, Taylor, Gaurthier, and Gossard (1987), where participants in the placebo analgesic group relied less on personal resources for pain control, Jensen, et al. noted a significant relationship between participant's dysfunction and higher use of rest and greater overall disability. Although the population selected for study by Gattuso, Litt, and Fitzgerald (1992) did not include those with chronic pain, the results revealed that self-efficacy belief mediated the relationship between pain intensity and disability. In other words, participant's coping self-efficacy predicted the outcome of pain intensity and disability. Self-efficacy mediated pain intensity, coping with pain, functional capacity, and reliance on personal resources rather than reliance on analgesics.

Self-efficacy and impairment.

The final eight studies (Arnstein, 2000; Haldorsen, Kronholm, Skouen, & Ursin, 1998; Johansson & Lindberg, 2000; Lackner, Carosell, & Feuerstein, 1996; Levin, Lofland, Cassisi, Poreh, & Blonsky, 1996; Lin & Ward, 1996; Seff, Gecas, & Ray, 1992; Waldrop, Lightsey, Ethington, Woemmel, & Coke, 2001) examining self-efficacy and impairment are the most closely related to the topic of work self-efficacy. The substantive findings include the results of Levin, Lofland, Cassisi, Poreh, and Blonsky (1996) who found a significant negative relationship between high self-efficacy and low back pain. That is, participants with higher levels of self-efficacy belief experienced lower levels of psychological distress, pain severity, and pain behavior than those with lower levels of self-efficacy belief. These results were supported by Seff, Gecas, and Ray (1992) who reported a significant correlation between high self-efficacy and self-esteem; both were

negatively related to depression. Likewise, Lackner, Carosell, and Feuerstein (1996) concluded that participants with higher levels of physical function self-efficacy revealed significantly greater physical function than participants with lower physical function self-efficacy. Hence, participant's physical function self-efficacy expectation appears to be a good predictor of the participant's actual physical ability. Lin and Ward (1996) reported a positive correlation between participants' perceived self-efficacy and coping behavior with outcome expectancies and participants' perseverance in coping behavior. Similar to conclusions reached by Litt (1988), and Rokke, Absi, Lall, and Oswald (1991), Waldrop, Lightsey, Ethington, Woemmel, and Coke (2001) reported that participant's self-efficacy beliefs and performance could be enhanced through incrementally mastering experience, providing participants with prompt positive feedback and recording improvements and giving individuals access to their reports. Alternative to evaluation of the self-efficacy variable on participant's return to work, Haldorsen, Kronholm, Skouen, and Ursin's (1998) research revealed that early testing of the severity of participant's anxiety and depression seemed to be the most important variables in predicting a poor prognosis for their return to work. In contrast, Johansson and Lindberg (2000) research revealed that only affective distress significantly contributed to the prediction of disability scores on the Multidimensional Pain Inventory. Johansson and Lindberg (2000) recommended that classification of individuals with low back pain by symptom duration should be replaced by grouping them according to behavioral and psychosocial factors. Finally, Arnstein (2000) concluded that pain is mediated by the participant's self efficacy beliefs, which suggest that participants with chronic pain might become disabled as a result of low self-

efficacy expectation. The higher the level of self-efficacy belief that one can cope with pain and function, the greater is the likelihood that the pain will not be disabling.

In summary, these researchers revealed that individuals with high self-efficacy experience less pain, psychological distress, pain severity and they demonstrated higher self-esteem, physical functioning, and coping behavior.

Statement Of The Problem

Some individuals with musculoskeletal injuries and associated pain are able to cope and continue to live productive meaningful lives and return to work, while others do not. Disability is complex (Osterweis, Kleiman, & Mechanic, 1987). Within the complex interplay of factors that affects injured individuals' judgments on whether they can return to work, it is unclear how professionals in the health care field, private insurance companies, and compensation systems could best intervene to assist individuals to make the transition from treatment to work. However, it is clear that, should the injured individuals fail to return to pre-injury employment or modified work, and not develop alternate employment options, they will ultimately deplete their financial resources.

The immediate effect of a musculoskeletal injury is tissue damage and pain. Through effective medical treatment musculoskeletal injuries heal, but pain may take longer to resolve. However, Pearce and Erskin (1993) noted that individuals with pain may subsequently experience depression, feelings of helplessness, anger, frustration, and social isolation, which makes coping with pain extremely difficult. Osterweis, Kleiman, and Mechanic (1987) pointed out that chronic pain is concurrently a physiological and psychological process. An individual's reaction to pain is dependent on intrinsic factors such as the individual's evaluation of previous illness, personality trait, and extrinsic

circumstances. Moreover, how an individual perceives symptoms resulting from injury and the meaning they associate with them might influence pain intensity, duration, and the individual's view of impairment, disability benefits, and judgment of their ability to work.

Compounding the problem of an individual's evaluation on whether they are capable of returning to work is the medical community's focus on the individual's physical symptoms. Throughout the complex treatment regime, the individual's perception of their ability to cope with pain, increase their physical function, reduce depression, and return to work are not systematically evaluated. This limitation is troubling in light of Osterweis, Kleiman, and Mechanic's (1987) assertion on the complex interplay of factors that affect an injured individuals' judgment of their perceived ability to return to work.

Although the medical model is focused on the individual's recovery from the primary injury, ancillary professionals need not have the same perspective. On the contrary, Bandura's (1977) self-efficacy theory offers hope to individuals endeavoring to return to work and the professionals facilitating them to do so. Bandura (1977) theorized that individuals maintain considerable influence over the outcome of their experience depending on self-perception. If this is the case, then it follows that the self-efficacy judgments of individuals on whether they can cope with pain, increase physical function, reduce depression and return to work, influences their eventual success. Information on individual's judgments of their ability to return to work would be beneficial to both the injured individuals and professionals charged with helping them. Valued resources could be targeted to individuals in needs. However, the professional community requires a tool that would provide insight into the individual's work self-efficacy belief. This

information would facilitate the targeting of self-efficacy enhancing cognitive/behavioral treatment and focused occupational rehabilitation designed to challenge the individual' low self-efficacy belief (Arnstein, 2000; Gage, Noh, Polatajko, & Kaspar, 1994).

Summary

Through effective medical treatment, musculoskeletal injuries heal and most individuals returned to work; however, some do not make the transition from medical treatment to return to work. The WCB employs a medical model, which is primarily focused on treatment of individuals' injuries. The factors that influence injured individuals' judgments about their ability to return to work are not systematically evaluated in practice or in the research literature. Consequently, services that could be offered to assist individuals with a low level of work self-efficacy are not systematically offered. This in turn could lead to increased cost for the WCB, long-term disability, Canada Pension Plan, and Provincial income assistance benefits.

Purpose of the study

This study has two purposes; first, to construct and test a questionnaire that could be used to obtain work self-efficacy judgments of individuals injured on the job; and second, to develop base line scores on subscale of the Return to Work Self-Efficacy Scale of individuals who participated in the research.

Hypothesis

Psychological influences create and strengthen one's expectation of personal efficacy (Bandura, 1977). Individuals may present with varying levels of work self-efficacy. However, research is lacking on whether individuals with higher levels of work self-efficacy are more likely to return to work sooner following an injury than individuals

with lower levels of work self-efficacy. This study will test the following hypothesis: Individuals who reveal higher levels of work self-efficacy, compared to those who report lower levels of work self-efficacy, will also present the following:

1. A high level of coping with pain self-efficacy;
2. A high level of functional self-efficacy;
3. A high level of coping with symptoms self-efficacy;
4. Are more likely to return to work.

Rationale

The paucity of research on work self-efficacy leaves health care professionals without an empirical base for their practice. Of necessity these professionals must rely on ancillary research on self-efficacy, which was reviewed earlier in this paper. Although professionals may extrapolate the fundamental role self-efficacy plays in initiating individuals' actions, empirical research is lacking on the topic of work self-efficacy. The proposed study is the first step to filling the research void on the influence work self-efficacy has on the individual's eventual return to work. Through development and testing of the Return to Work Self-Efficacy Scale, health care professionals will be provided with a tool that will assist them to identify the level of work self-efficacy judgments individuals maintain on whether they are capable of returning to work following injury. Individuals with a low-level work self-efficacy could be targeted for appropriate service orientated to enhancing their self-efficacy judgments regarding work.

CHAPTER TWO METHODS

Participants

Due to time constraints, a convenience sample of 19 participants was drawn from December 2003 to March 2004 from a population of individuals who experienced work related musculoskeletal injury. The participants were in receipt of Workers' Compensation benefits and attended their final treatment modality at the Occupational Rehabilitation Program (ORP), Canadian Back Institutes (CBI).

Procedures

The manager of the Occupational Rehabilitation Program, Canadian Back Institute authorized this study in the CBI's facility in a small city in mid-British Columbia. Following an individual's referral to the ORP, the manager of the ORP participated as a team member in the intake interview with the newly referred individual. During the intake interview, or shortly afterward, the manager informed the newly referred individual that the CBI was supporting the research that was being conducted by a university student. The manager asked the individual whether the individual would be interested in speaking with the researcher about participating in the research. With the individual's agreement to speak with the researcher by telephone, the manager obtained consent from the individual to release the individual's telephone number. The manager contacted the researcher by telephone and provided him with the individual's telephone number. The researcher established telephone contact with the individual and informed the individual that he was studying how individuals' injuries have affected their lives. With the individual's agreement to participate in the study, a meeting was arranged for the following day at the ORP.

The researcher met with the each individual who agreed to participate in the study and provided each individual with a copy of the information package and the consent form (Appendix C). Individuals were told that the research had two purposes, namely, to test a questionnaire that was developed for this research project, and to evaluate how individuals can be assisted when they are injured on the job. The researcher informed the participant that all individuals who were referred to the Occupation Rehabilitation Program, Canadian Back Institute were eligible to participate in the research. The research consisted of an interview at the CBI where two questionnaires were administered. The questions were developed to obtain information on how the participants rate themselves on a given topic. As well, each participant was asked for information on the type of injury the participant sustained and on the type of work the participant performed. Participants' time involvement in the research consisted of approximately 20 to 30 minutes.

Data were collected through an in-person interview at the ORP. The researcher administered the questionnaires by reading the questions and noting the participant's verbal response to the questions. The final information was gathered one week following participant discharge from the ORP. I contacted the participant by telephone and questioned the individual about the individual's return to work status. This information was documented using a modified Cutler, Fishbain, Hubert, Khalil, and Rosomoff, (1994) schema (Appendix E).

Measures

The following information was documented (Appendix A): each participant's age, marital status, education, type of work performed, length of time with the pre-injury employer, length of time off work, and each participant's most recent contact with his/her pre-injury employer. As well, the participant's type of injury and area of the body affected were documented through a modified Merskey & Bogduk (1994) classification system (Appendix B).

Several questionnaires were administered. One was the Return to Work Self-Efficacy Scale, which was developed for this research. The scale was modified from Anderson, Dowds, Pelletz, Edwards, and Peeters-Anderson's (1995) Chronic Pain Self-Efficacy Scale (CPSE Scale). Anderson et al. (1995) developed the CPSE Scale as a method to provide a standardized measure of self-efficacy for chronic pain. Anderson, et al. (1995) adapted their scale from Lorig, Chastain, Ung, Shoor, and Holman's (1989) 20 item Arthritis Self-Efficacy Scale and normed it on a sample of 141 chronic pain patients who had been referred to an outpatient pain management program at a university medical center. However, Anderson's, et al. CPSE Scale is not appropriate for use in a population who has not been diagnosed with chronic pain. Therefore, the CPSE Scale was modified in order to reflect the circumstances of individuals who have been injured on the job and are at the end stage of treatment pending their return to work. The Return to Work Self-Efficacy Scale consists of 27 items developed to measure an individual's self-efficacy judgments relating to pain management, physical function, work self-efficacy and coping with symptom (Appendix F). Like the CPSE questionnaire, the Return to Work Self-

Efficacy Scale response options are recorded on a scale with five point increments from 0% (very uncertain) to 100% (completely certain).

Exploratory face validity and internal consistency of the Return to Work Self Efficacy Scale was evaluated through administration of the scale to 31 education students at the local university. The alpha coefficients of the four self-efficacy domains were as follows: pain self-efficacy .74, physical function self-efficacy .92, work self-efficacy .75, and, coping with symptoms self-efficacy .91.

The second instrument that was utilized in this study was the Medical Outcome Study 36-item Short Form, SF-36 (Ware & Sherbourne, 1992). The SF-36 was designed to assess eight health care issues or domains (Appendix G). These items include physical functioning, role physical, role emotional, bodily pain, vitality, social functioning, mental health (happiness, nervousness and depression), and general health perception. Each individual's scores were rated on a scale from 0 to 100. The SF-36 is utilized extensively in the health care system due to its high level of reliability, validity and normative data. Canadian norms have been developed (Hopman, et al. 2000).

Ethics

This research was approved by the Ethics Board, UNBC (Appendix H). Confidentiality of the information was assured through restriction of access to the completed questionnaires to the UNBC research co-supervisors and the researcher. Each participant in the research was provided with a code number, which was noted on the participant's questionnaire. Names were not used. The list of code numbers was stored in a locked cabinet separate from the questionnaires. As already described, participation in the research was voluntary. Participants were free to withdraw at any point of the

interview or as the study progressed. There were no expected risks resulting from participation in the research. Responses to the questions were entered directly into a database. Once the data were in the data base there was no method of identifying an individual person. When the study is complete including all publication attempts, the questionnaires will be shredded and the data base erased from the computer hard drive and disks thereby destroying the data. All participants will be mailed a summary of the research results.

CHAPTER THREE RESULTS AND DISCUSSION

The sample for this study is comprised of 19 participants who had been injured on the job and were attending the last phase of their treatment at an Occupational Rehabilitation Program provided by the Canadian Back Institute. Following treatment, 15 participants returned to work and 4 participants did not return to work. The sample was composed of 12 males ranging in age from 29 to 63 years (mean 41.1 years) and 7 females varying in age from 27 to 49 year (mean 38.7 years). Eleven of the participants were married, 4 were single, 3 were living with partners, and 1 was a widowed.

Unlike the variability in the sample's marital status, participants' education level varied less. Education level was recorded by noting the participants' highest school grade completed. Those with a trade certificate were coded as completing 13 years of education while participants with two years of college were classified as completing 14 years of education. The mean education level was 12 years. Three participants completed trade certificates, one individual completed one year of college, and two participants had two years of college. Although the sample included a range of employment types, three participants worked as sawmill labourers, three were mechanics, and three were store clerks; other individual's work consisted of a tire shop repair labourer, a mine labour, a dock worker, a nurses' aide, a home support worker, a pipe fitter, a janitor, a carpenter, a carpenter's helper, and a hospital house keeper.

Even though the participants were employed in a variety of occupations, trauma to the lumbar back with non surgical intervention, was the largest proportion of work place injuries experienced by participants in this study (N = 7). Two participants with lumbar injuries required surgery. Injury to a participant's leg or foot was the second most

common trauma with two participants receiving surgery while two others did not require surgery. Two participants experienced shoulder injuries and required surgical intervention while one participant's shoulder injury was medically managed without surgery.

The participants' time loss from work, due to injury, ranged from zero weeks to 100 weeks. The interquartile range was 50 weeks (range 12 to 52 weeks) with a median of 39 weeks. In other words, the middle half of the sample missed 50 weeks of work prior to attending the ORP treatment. However, although the participants were absent from the work place, the participants maintained contact with their employer varying from one week from the last contact to 16 weeks (interquartile range 3 weeks) with a median of one week.

Table 1 contains descriptive statistics that allow comparison of the participants' results on the Return to Work Self-Efficacy Scale of those who returned to work (RTW) and those who did not return to work (NRTW), following treatment at the Occupational Rehabilitation Program.

Table 1

RTW and NRTW Groups Mean Scores on the Return To Work Self-Efficacy Scale

Categories	RTW (N=15)		NRTW (N=4)	
	M	SD	M	SD
1. Pain Self-Efficacy	50.92	10.87	15.20	7.12
2. Physical Function Self-Efficacy	35.41	15.02	13.12	9.93
3. Work Self-Efficacy	54.84	20.84	31.16	14.05
4. Coping With Symptoms Self-Efficacy	57.29	14.32	31.71	14.41

On each of the four Return to Work Self-Efficacy Scales subscales, participants in the RTW group revealed much higher mean score than participants in the NRTW group. However, on all subscales, the RTW group revealed generally higher variability in standard deviation than the NRTW group, notwithstanding the coping with symptoms self-efficacy subscale where the RTW group's standard deviation was 14.32 and the NRTW group's standard deviation was 14.41. In contrast, the RTW group's standard deviation on the work self-efficacy subscale was 20.84 while the NRTW group's standard deviation was 14.05, a difference of 6.79. Similarly, the RTW group's standard deviation on the physical function self-efficacy subscale was 15.02 compared to the NRTW group's standard deviation of 9.93 (5.09 difference). Although the standard deviations of both groups continued to be high on the pain self-efficacy subscale (RTW

10.87 and NRTW 7.13), the variance was less than the former subscales, but the variance continued to be large and reveals a somewhat flat, spread out distribution (DiLeonardi & Curtis, 1992).

To progress from discussion of the descriptive statistics to evaluation of whether there was a statically significant difference between the RTW and the NRTW groups' mean scores on the Return to Work Self-Efficacy Scale, t-tests for unequal variance was selected as the more cautious approach given the great variation in sample size. The results were reported in Table 2.

Table 2

T-Test Scores for RTW and NRTW Groups on Subscales of the Return to Work Self-Efficacy Scale

	t	df	p	d
Pain Self-Efficacy (PSE)	6.14	7	.0003	3.88
	t	df	p	d
Physical Function Self-Efficacy (FSE)	3.50	12	.0021	1.75
	t	df	p	d
Work Self-Efficacy (WSE)	2.30	9	.023	1.33
	t	df	p	d
Coping With Symptoms Self- Efficacy (CSE)	3.33	12	.003	1.78

Note. $p < .05$ on all, $N = 19$.

One tailed-tests with unequal variance with $\alpha = .05$ was selected to determine whether there was significant difference between the RTW and the NRTW groups on the Return to Work Self-Efficacy Scale. Analysis of the four RTW and the NRTW mean scores revealed a high significant difference on all four subscales of the Return to Work Self-Efficacy Scale. Cohen's d for the four t-tests revealed effect sizes ranging from 1.33 to 3.88. Cohen (1992) recommended that effect of sizes $\geq .8$ would be classified as large. The effect size evaluates the difference between the null hypothesis and the alternative hypothesis. Sedlmeier and Gigerenzer (1989) pointed out that the larger the effect size, the greater the power.

To evaluate the relationship between the variables in the Work Self-Efficacy Scale, Pearson's correlation was undertaken and reported in Table 3.

Table 3

Pearson's Correlation for the Subscales of the Return to Work Self-Efficacy Scale

Subscale	PSE	FSE	WSE	CSE
1. Pain Self-Efficacy	1.00	.92	.92	.86
2. Physical Function Self-Efficacy		1.00	.92	.83
3. Work Self-Efficacy			1.00	.90
4. Coping With Symptoms Self-Efficacy				1.00

Note. $N = 19$, $p < .05$ for all correlations.

The correlation between the four subscales of the Work Self-Efficacy Scale were high, ranging from .83 (physical function self-efficacy and coping with symptoms self-efficacy) to .92 (physical function self-efficacy and work self-efficacy; and, work self-efficacy and pain self-efficacy). Moreover, Cohen's (1992) criteria for all correlations greater than or equal to .5 are classified as large.

To further evaluate differences between the RTW and the NRTW groups, the results of the participants' responses on the SF 36 were compared between groups and they were then compared with the Canadian norms developed by Hopman, et al. (2000). Contrasts were evident between the participants of this study and the Canadian norms. Table 4 compares the participants' mean scores on the SF 36 with the Canadian norms.

Due to limited sample size, readers must be cautious when reviewing the comparisons between mean scores of the current study with the Canadian norms. The comparison was offered as a frame of reference to Ware's (1993) research that revealed higher scores on individual categories of the SF-36 indicated a better level of functioning in the category. Ware (1993) reported that the Mental Health, Role Emotional and Social Functioning scales provides a varied evaluation of the participants' mental health and are the best measures of mental health status. Perfect scores on the Role Emotional and Social Functioning scale indicate that the individuals' reports no restrictions or impairments as a result of personal or emotional problems. Alternatively, the Mental Health scale is scored bipolar with a mid range responses revealing no symptoms or psychological distress (Ware, 1993). A high score of 100 indicates that the respondents always feel happy, calm, and peaceful (Ware, 1993). As noted in Table 4, the participants' in this study revealed considerable variability between age groups. For example, on the Social Functioning scale, the low mean score of 22.6 was registered by the male group (25-34) while the male (55-64) group's mean score registered the highest mean score at 68.7, but both scores were considerably below the Canadian norm mean of 86.3 and 86.4 respectively. In contrast, scores on the Role Emotional scale revealed higher over all mean scores with considerable variability between mean scores. Although the male group's (55-64) mean score on the Social Functioning scale revealed a higher level of function than the other groups, their low mean score on the Role-Emotional scale (33.3 percentile), suggests this group experienced problems with work or activities of daily living due to emotional problems (Ware 1992). In contrast, males 45-54 and females 25-34 scored a perfect mean score of 100. The mean score of the Canadian norm

for was male (55-64) was 89.8, (male 45-54) was 85.6 and (female 25-54) was 77.6 on the Role-Emotional scale. The final measure of participants' mental health status was evaluated on the Mental Health scale. Participants' mean scores in this study revealed less variability than on the other mental health scales. Moreover, the participants' scores were on par with the Canadian norms. However, the males (35-44) group was the exception with a mean score of 58.2 and the female (44-54) group with a mean score of 33.3. However, as reported, the Mental Health scale is scored bipolar. Scores in the mid range indicates that the participants' revealed no symptoms or psychological distress.

Ware (1993) reported that the Vitality and the General Health scales are the most sensitive to physical and mental health outcomes. Low score on the Vitality Scale indicate that the respondents report feeling tired and worn out while mid range scores reveals and absence of symptoms. In contrast, scores of 100 indicates a lack of symptoms and a consistent feeling of pep and energy. Like the Mental Health scale, the General Health scale is scored bipolar. Mid range scores on the General Health scale reveals that the respondent experiences no unfavorable health symptoms. The participants' scores on the Vitality scale varied from a low mean score of 38.3 (female 25-34) to a high mean score of 56.2 (male 45-54); scores were at the lower end of the 100 point scale suggesting that the former group experienced reduced energy and vitality. In contrast, the Canadian norm revealed little variability between groups on the Vitality scale. Continuing with the general health scales, there was greater variability (45%) in the participants' mean scores on the General Health scale ranging from a low mean score of 42.3 (males 25-34) to a high mean score of 87.3 (female 35-44). Most of the scores where in the mid range of the

General Health scale, which suggests that the participants in this study experienced positive health; on par with the Canadian norms.

Ware (1992) reported that the Physical Function, Role-Physical, and Bodily Pain scales of the SF-36 evaluate three aspects of somatic health status. Specifically, while the Physical Function scale provides a behavioral measure of the respondent's reported limitation in activities of daily living, the Role-Physical scales measures the respondent's level of reported disability in activities of daily living resulting from physical problems. Alternatively, the Bodily Pain scale provides a measure of the individual's physical limitations due to the individual's experience of bodily pain.

Evaluation of the participants' responses on the Physical Function somatic scales reveals limited variability (20%) between the low mean scores of the female group groups (45-54) and the high mean score of the male group (55-64). Scores near and below the 50th percentile range of the scale suggests that, overall, the participants in this study experienced a moderate level of limitation in completing activities of daily living. On the same scale, the Canadian norms' mean scores ranged between the 84.7 percentile and 94.0 percentile (9.3% difference), which would suggest that most vigorous activities of daily living were performed without limitation due to health. Continuing with the somatic health status, the Role-Physical scale revealed little variability between the groups in this study. However, the low mean scores of 0 for five of the groups and the high mean score of 5.0 indicates that the participants in this study experienced substantial problems performing work and other activities of daily living as a result of health care problems. The reader must interpret these floor level mean scores with caution. As reported, the participants' semi-interquartile range of work time loss was 50 weeks

(median 39 weeks), which may account of the low mean scores on the Role-Physical scale items relating to participation in work activity. A more complete understanding of the effects of the participants' injuries on their general health would be obtained by reviewing the results of the final scale. The participants' mean scores on the Bodily Pain scale revealed little variability (25%) between the low mean score of the male group (35-44) and the high mean score of the female group (45-54). All groups' mean scores were below the 50th percentile on the Bodily Pain scale which suggested that participants in this study experienced substantial limiting bodily pain. In contrast, the Canadian norm on the Bodily Pain scale was near the 75th percentile on the Bodily Pain scale.

Table 4

Participant's Scores on the SF-36 Compared with the Canadian Norms by Gender and Age Group

	Means							
SF 36 subscales	PF	RF	BP	GH	VT	SF	R-E	MH
Male 25-34 (N=3)	**42.6**	**00.0**	**31.3**	**42.3**	**50.0**	**22.6**	**55.6**	**78.6**
Canadian norm	94.0	90.6	79.1	80.1	68.7	88.7	88.3	77.7
Male 35-44 (N=5)	**42.0**	**5.0**	**16.0**	**58.2**	**42.0**	**42.5**	**73.3**	**55.2**
Canadian norm	91.7	85.8	77.3	79.6	69.4	87.5	84.3	78.0
Male 45-54 (N=2)	**30.0**	**00.0**	**31.5**	**58.5**	**50.0**	**56.2**	**100.0**	**70.0**
Canadian norm	89.3	87.3	79.6	77.4	67.7	88.5	87.1	78.0
Male 55-64 (N=2)	**45.0**	**00.0**	**22.0**	**64.5**	**65.0**	**68.7**	**33.3**	**76.0**
Canadian norm	84.7	85.4	77.0	74.4	70.8	89.8	91.9	81.7
Female 25-34 (N=3)	**45.0**	**00.0**	**27.6**	**73.6**	**38.3**	**50.0**	**100.0**	**74.6**
Canadian norm	90.9	83.7	75.0	77.9	61.2	83.7	77.6	74.0
Female 35-44 (N=3)	**38.3**	**00.0**	**31.3**	**87.3**	**47.6**	**45.8**	**88.8**	**81.3**
Canadian norm	90.1	81.0	75.1	78.1	62.9	83.5	82.1	76.6
Female 45-54 (N=1)	**25.0**	**00.0**	**41.0**	**82.0**	**40.0**	**50.0**	**33.3**	**56.0**
Canadian norm	86.6	82.0	72.9	77.2	63.3	84.3	84.2	75.6

Note. PF = Physical Function, R-P = Role-Physical, BP = Bodily Pain, GH = General Health, VT = Vitality, SF = Social Functioning, R-E = Role-Emotional, MH = Mental Health. Can Norm = Canadian Norms.

Discussion

This study had two purposes; the first purpose was to develop a self-efficacy scale for use by professional in the health care field; and, the second purpose was to test the scale and establish base line scores on the Return to Work Self-Efficacy Scale. Four hypotheses were tested.

Evaluation of the Hypothesis

Inferential statistics were employed to evaluate the hypotheses that participants with a high level of work self-efficacy would also present with (1) a high level of coping with pain self-efficacy, (2) a high level of physical function self-efficacy, (3) a high level of coping with symptoms self-efficacy, and, (4) would be more likely to return to work.

The first hypothesis was evaluated by comparing the RTW (N = 15) group and the NRTW (NRTW = 4) group's mean scores (M = 50.12, M = 15.20 respectively) on the coping with pain self-efficacy items of the Return to Work Self-Efficacy Scale. The RTW group's mean score was 35.75% higher than the mean score of the NRTW group's mean score, which suggests that in this small sample, participants with a higher level of work self-efficacy presented with a higher level of coping with pain self-efficacy. T-test analysis of the RTW (N = 15) and the NRTW (N = 4) group's mean scores on the pain self-efficacy items revealed a high significant difference ($t = 6.14$, $p < .05$, Cohen's $d = 1.75$) between the two groups. These results support the conclusions of Levin, Lofland, Cassisi, Poreh, and Blonsky (1996) who found that participants with higher levels of self-efficacy belief experienced lower levels of psychological distress, pain severity, and pain behavior than those with lower levels of self-efficacy belief.

Similar to the finding on the first hypothesis, the RTW group's mean score (M = 35.41) on the physical function self-efficacy items of the Return to Work Self-Efficacy Scale, was 22.29% higher than the mean score (M = 13.12) of the NRTW group. Like the pain self-efficacy subscale results, a t-test of the RTW and the NRTW groups mean scores on the physical function subscale revealed a high significant difference ($t = 3.50$, $p < .05$) with a large effect size ($d = 1.33$). The results favor accepting the hypothesis that individuals with a high level of work self-efficacy will also present with a high level of physical function self-efficacy. These results are consistent with the findings of Gattuso, Litt, and Fitzgerald's (1992) who reported that self-efficacy mediated pain intensity, coping with pain, functional capacity, and reliance on personal resources rather than reliance on analgesics. Likewise, Cipher and Fernandez (1997) concluded that self-efficacy expectations of pain were significantly associated with pain tolerance. Consequently, if participants in the Non-Return to Work Group expected that physical activity would exacerbate their pain, they may not rate their physical function or ability to work as high.

Analysis of the third hypothesis reveals that the RTW group's mean score (M = 57.29) on the coping with symptoms items was 25.58% higher than the mean score (M = 31.71) of the NRTW group. Similar to the other self-efficacy scales, t-test revealed a high significant difference ($t = 3.33$, $p < .05$) with an effect size of $d = 1.78$ between groups. These results suggest that individuals with a high level of work self-efficacy will also present with a higher level of coping with symptoms self-efficacy than individuals with a low level of work self-efficacy; this is consistent with the conclusions drawn by Lackner, Carosell, and Feuerstein (1996), and Lin and Ward (1996). The former researchers

reported that participants with higher levels of physical function self-efficacy revealed significantly greater physical function than participants with lower physical function self-efficacy. The latter revealed a positive correlation between participants' perceived self-efficacy and coping behavior with outcome expectancies and participant's perseverance in coping behavior.

On the work self-efficacy subscale, the RTW group's mean score was 54.84 while the NRTW groups' mean score was 31.16, a difference of 23.68%. Moreover, the t-test indicated a significant difference ($t = 2.30$, $p < .05$) between the two groups. These results suggest a view that individuals with a high level of work self-efficacy are more likely to return to work than individuals with a lower level of work self-efficacy. This conclusion is consistent with Arnstein (2000) who reported that the higher the level of self-efficacy belief that one can cope with pain and function, the greater is the likelihood that the pain will not be disabling. Hence, individuals with high self-efficacy, whether for coping with pain, physical function, or coping with symptoms, are more likely to return to work.

While the forgoing has demonstrated considerable empirical support for the effects of individual's high self-efficacy belief on coping with pain, coping with symptoms and physical function, aside from the current study, there is no other research on the effects of work self-efficacy on individuals' return to work following an industrial accident. However, with the high correlation between the four subscales of the Return to Work Self-Efficacy Scale, one may conclude that individuals who possess a high level of work self-efficacy will also maintain a high level of pain self-efficacy, a high level of physical function self-efficacy, and coping with symptoms self-efficacy. Moreover, they

will more likely to return to work than individuals with lower levels self-efficacy.

Correlation Analysis of Return to Work Self-Efficacy Scale

Correlations between subscales of Return to Work Self-Efficacy Scale were high ($p < .05$) from .92 (pain self-efficacy and physical function self-efficacy), .92 (pain self-efficacy and work self-efficacy), .86 (pain self-efficacy and coping with symptoms self-efficacy), .92 (physical function self-efficacy and work self-efficacy), .83 (physical function and coping with symptoms self-efficacy) and .90 (work self-efficacy and coping with symptoms self-efficacy). Again, the Cohen's was greater that .5 effect was large. Correlations of the magnitude displayed on the four subscales indicate that the subscales were measuring a similar construct, namely, self-efficacy.

Although all correlations on the Return to Work Self-Efficacy Subscales were high, the subscales that paired pain self-efficacy or physical function self-efficacy with subscales that involved physical function or work revealed the highest (.92) correlation. To better understand these high correlations, Bandura theorized that of the four information states, performance attainment was the most influential source of self-efficacy information. However, in the current study, the high correlations that associate pain self-efficacy with activity suggest that the emotional arousal information influenced the participants' self-efficacy related to physical function and work. Emotional arousal provides individuals' with somatic feedback on their physiological states. The participants may interpret pain as an ominous sign of pending dysfunction which in turn causes fear and agitation leading to an inhabitation of performance (Bandura 1977). However, the relationship between self-efficacy information and pain does not appear to provide a full explanation for the high correlations between pain self-efficacy and

physical function and work self-efficacy considering the results of Gattuso, Litt, and Fitzgerald (1992) and Arnstein (2000) who concluded that self-efficacy belief mediated the relationship between pain intensity and disability. In other words, a high level of self-efficacy leads to reduced pain intensity and disability. In contrast, individuals with a low level of self-efficacy may interpret their somatic sensation of pain as an inhibitor to action.

The results of this study support Bandura's Self-Efficacy Theory. The participants with high work self-efficacy were more likely to return to work, had a higher level of pain self-efficacy, a higher level of physical function self-efficacy, and a higher level of coping with symptoms self-efficacy than participants with a lower level of work-self-efficacy.

Analysis of the SF-36

Although differences were noted between the RTW and the NRTW groups on the Return to Work Self-Efficacy Scale, the sample size was too small to compare the results of the two groups on the SF-36. Ware's (1993) research revealed that males and females should be evaluated by age category and not compared by gender given that on selected subscales of the SF-36, males score higher than females. However, the results of the participants' responses by gender and age group mean scores on the SF-36 in the current study, revealed differences on some subscales of the SF-36 Canadian norms developed by Hopman, et al. (2000). The substantial finding of the SF-36 questionnaire revealed differences between age groups on the mental health scales. Of the categories (gender and age) in the current study, five of the categories revealed a mean score at or below the 50^{th} percentile on the Social Functioning scale. Low scores on this scale

suggest that many of the participants experienced problems with normal social functioning resulting from physical or emotional problems (Ware 1993). These results are not surprising considering that the participants in the current study were recovering from an industrial accident and experienced some level of pain and discomfort. In contrast, the participants' means scores on the Mental Health scale revealed a lack of nervousness and depression. Thus, the sample in the current study appeared to manage their level of pain and as a result, it did not progress to concurrent depression.

As a whole, the sample's mean scores on the Vitality scales suggested that most of the participants experienced some level of low energy and vitality, but they were not at the low end of the scale, that is, tired and worn out. Hence, although no firm conclusion can be drawn, it appears that the participants in this study were within the normal range of the Canadian norm. This would account for the absence of floor level scores.

Similar to the formerly mentioned subscale, on the Role Physical scale, the sample revealed mean scores that were substantially below the Canadian norm, which suggested the participants in this study experienced a moderate level of limitation in completing activities of daily living. These low scores are accounted for, in part, by the fact that the participants were not working. Consequently, the SF-36 items that related to the influence of physical function involving the participant's work activities, received a negative answer.

Likewise, the participants' scores on the Bodily Pain scale indicate that participants in this study experienced substantial limiting pain. This result is consistent with the participants' stage of physical recovery from an industrial accident. Moreover, the increased activity level that participants experienced in the Occupational

Rehabilitation Program would, in the short term, likely increase the participants' level of bodily pain.

Conclusion

Four hypotheses relating to work self-efficacy were evaluated in this study. The results suggests that individuals with a high level of work self-efficacy, also presented with a high level of coping with pain self-efficacy, a high level of physical function self-efficacy, a high level of coping with symptoms self-efficacy, and that they were more likely to return to work following injury. These conclusions are consistent with the results of Seff, Gecas, & Ray (1992) who reported a significant correlation between high self-efficacy and self-esteem. Similarly, Lackner, Carosell, & Feuerstein (1996) concluded that participants with higher levels of physical function self-efficacy revealed significantly greater physical function self-efficacy than participants with lower levels of physical function self-efficacy.

Due to time constraints, a limited sample (N = 19) was selected for this study. One tailed t-test with unequal variance with $\alpha = .05$ revealed a high significant difference between the RTW and the NRTW group on all four subscales of the Return to Work Self-Efficacy Scale. Although the sample size was limited, Cohen's d for effect sizes was large, suggesting that the study had power (Sedlmeier and Gigerenzer, 1989). Comparison of the RTW group and the NRTW groups' mean scores on the four subscales of the Return to Work Self-Efficacy Scale revealed that the pain self-efficacy subscale evidenced the most pronounced difference between the two groups ($t = 6.14$, $p = .0003$). Although a definitive conclusion cannot be drawn on this pronounced difference, Bandura (1977) theorized that the emotional arousal information state provides individuals' with somatic feedback on their physiological states. The participants with a low level of pain self-efficacy may interpret pain as an ominous sign of pending

dysfunction which in turn causes fear and agitation and low rating on the pain subscale of the Return to Work Self-Efficacy Scale. However, as reported by Gattuso, Litt, and Fitzgerald (1992) self-efficacy belief mediated the relationship between pain intensity and disability.

Following the participant's discharge from the Occupational Rehabilitation Program (ORP), Canadian Back Institute (CBI), the researcher contacted individuals by telephone and completed the discharge post treatment return to work outcome. The researcher also asked each participant what was helpful to them in their treatment at the ORP. Consistent with the outcomes of studies of Cipher & Fernandez (1997), Dolce, Doleys, Raczynski, Lossie, Poole, & Smith (1986), Litt (1988); Rokke, Absi, Lall, & Oswald (1990), eight of participants in the current study, who returned to work, reported that they felt as though they were given their lives back. Consistently participants stated that the professionals at the Occupational Rehabilitation Program provided them with a high level of support, encouragement and education related to their injuries and the associated pain. The support, education, and carefully tailored exercise programs, and in some cases physiotherapy treatment, resulted in the participants reporting that they gained flexibility, physical strength and confidence in their ability to return to their former activities, including work. Most of the participants intended to continue to exercise and stretch post treatment.

Unlike the results of Jensen, Turner, and Romano's (1991) study of chronic pain, where the majority of the sample believed that rest and opioid medication would relieve their pain in the short term and that exercise would exacerbate their pain condition, the

participants in the current study found that their physical abilities improved with activity. However, most of the participants stated that their level of pain did not change.

Limitations of this study

This exploratory research has a small sample size, which limits generalizing to the population. Further delimitations involve selecting a sample of individuals who were injured on the job and were at the end of their treatment. Alternatively, the sample could have included individuals at various stages of recovery. As well, the research could be enhanced through the addition of a post treatment retest measure. The retest measure could reveal changes in the participant's work self-efficacy over time and the treatment process. Although two test instruments are employed in the research, the research could be enhanced through the addition of a scale to measure depression. With the addition of another scale and increased sample size, analysis of the data could be enhanced to include logistic regression. This level of analysis could be used to predict outcomes.

Recommendation for further study

Future research would benefit by selecting a larger sample size thus allowing for analysis that would include logistic regression with a goal to developing a model to predict which individuals are more likely to return to work following treatment.

Although researchers in the social science use logistic regression to predict an outcome (Hamilton, 1992; Howell, 2002), the statistical model requires adherence to specific criterion. When Hamilton's (1992) criterion for use of logistic regression analysis are applied to these results, it is clear that the current sample size is too small; the Y variable has only four cases of non return to work resulting in a lack of variability. Moreover, the current results revealed high multicollineary; for example, the correlation between the variables, coping with symptoms self-efficacy and pain self-efficacy was .86 and the correlation between work self-efficacy and physical function was .92.

Hamilton (1992) identified that the logistic regression model requires that true conditional probabilities are used, that the responses are independent, and that the X variables need not be linear functions. Furthermore, high multicollineary results in highly inflated errors of the estimate and low power. Hamilton (1992) suggested that researchers restrict the use of logistic regression to samples of roughly 200 cases. However, as Hamilton (1992) pointed out, even with a large sample size, researchers must be cautious if only five of their cases are reported on the Y variable since only limited information will be gained on the effects of the X variable. Hence, although logical regression is the appropriate statistical analysis for predictive purposes in social science research, it was not appropriate to use in the current study.

The Return to Work Self-Efficacy Scale has high multicollineary. Each of the subscales appears to be measuring the same construct. Therefore, if researchers wish to use the Return to Work Self-Efficacy Scale, consideration could be given to using one of the subscales rather than all four of the subscales. This would allow for shortened administration and analysis.

Should future researchers want to employ the SF-36 in a similar study as the current one, findings could be enhanced by obtaining Hopman's, et al. (2000) raw scores thus allowing for analysis of mean scores between groups. Finally, I would recommend that a depression inventory be added to the test battery. This scale would provide a more in-depth evaluation of participant's mental health and would augment the SF-36 Mental Health scale.

In conclusion, this research established a base line for future research on work self-efficacy of individuals who have been injured on the job. Moreover, the research established and tested the Return to Work Self-Efficacy Scale. However, the scale requires further evaluation and validation before professionals employ the scale as an evaluative tool. Early internal consistency established for these instruments were promising.

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Appendix A

Demographic data

Demographic data

Identification code: _____

Gender: Male – Female _____

Age: _____

Marital status:
- Single _____
- Married _____
- Common-law _____
- Partner _____
- Separated _____
- Divorced _____
- Widow (er) _____

Type of work performed: _____

Length of time off work: _____

Most recent contact with employer: _____

Education (grade): ≤ 6th, ≤10th, ≤12th, = 12th,

trade, <1 yr. college, ≥2 yrs. college.

Appendix B

Classification of injury and pain (Merskey & Bogduk 1994)

Code number:___

Classification of injury and pain (Merskey & Bogduk 1994)

Localized symptoms of the head

	With surgery	No surgery
face		
ears, nose, oral cavity		
cranium l		

Spinal pain

	With surgery	No surgery
cervical		
thoracic		
lumbar		
sacral		
coccygeal		
diffuse or generalized		

Localized syndromes of the upper limbs

	With surgery	No surgery
shoulder		
elbow		
wrist		
hand		

Truck pain

	With surgery	No surgery
Chest		
abdomen		

Lower leg

	With surgery	No surgery
leg or foot		
Hip or thigh		

Appendix C

Consent form and informed consent form

Consent form and informed consent form

Thank you for your willingness to participate my University of British Columbia research project. This letter serves as an information package designed to provide you with the background to the study.

This research has two purposes. The first purpose is to test a questionnaire that was developed for this research project. The second purpose is to evaluate how individuals can be assisted when they are injured on the job. Individuals, who have been referred to the Occupation Rehabilitation Program, Canadian Back Institute, are eligible to participants in the research.

Your participation in the research will consist of an interview at the Occupation Rehabilitation Program, Canadian Back Institute office. You will be asked information about demographics and the type of your injury you sustained. Two questionnaires will be administered. Your involvement in the interview will consist of approximately 20 to 30 minutes. When you have been discharged from the Occupation Rehabilitation Program, Canadian Back Institute I will contact you by telephone regarding your return to work.

The questionnaires will be coded with a number; your name will not appear anywhere in the research, which will provide you a high level of anonymity. As well, I have attempted to provide confidentially of the information you provide by restricting access to the questionnaires limited to me and my research supervisor. Questionnaires will be stored in a locked filing cabinet separate from the number codes. Answers to the questions will be entered directly into a database. There will be no method of identifying individual responses. Once the research is complete, the questionnaires will be shredded and the data base erased.

Your responses to the questionnaires will not influence your Workers' Compensation claim or your treatment at the Occupation Rehabilitation Program, Canadian Back Institute.

I do not anticipate that your participation in this study will pose physical or emotional risk to you or others. However, should you wish to speak to me (debrief) after you have completed the questionnaires or later on, I am available to you. You may access me through Marcy Leiva, Manager, Occupation Rehabilitation Program, Canadian Back Institute and she will contact me. Alternatively, should you feel that you require counselling, please contact your physician and request a referral to Mental Health Services, Ministry of Health.

Your involvement in the study is completely voluntary. You are free to withdraw at any point of the interview or as the study progresses. Should you withdraw from the study, all of the information that you have provided will be removed from the study and destroyed.

This research could be beneficial to others who have been injured on the job. For example, the questionnaire could be used to evaluate the type of services others might need.

Any questions about the study can be directed to Professor Trudy Mothus, University of British Columbia (telephone 250- 960 5639). You will be provided a copy of the study in the summer of 2004.

Complaints about the research can be addressed to Dr. Max Blouw, Vice President of Research, UNBC (250 960 5820).

If you continue to be willing to participate in this study, please see the informed consent form on the next page.

Regards,

Barry Ennis,
Master of Education candidate.

Professor T. Mothus.

Code number:___

Informed Consent Form

Do you understand that you have been asked to be in a research study?	Yes	No
Have you received a copy the information package and read it?	Yes	No
Do you understand that the questions in the research interview will be recorded in number format and entered into a database?	Yes	No
Have the risks, if any of the study, been explained to you?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate or to withdraw from the study at any time without giving a reason?	Yes	No
Do you understand that your participation in the research will not affect your Worker's Compensation claim?	Yes	No
Has the issue of anonymity and confidentiality been explained to you?	Yes	No
Do you understand who will have access to the information that you provide	Yes	No

This study was explained to me by: Barry Ennis, UNBC M.Ed candidate.

I agree to take part in this study.

_____ _____

Signature of Research Participant Date

_____

Please print name

I believe that the person who signed this form understands what is involved in the study and voluntarily agrees to participate.

_____ _____

Signature of researcher Date

Appendix D

Client's letter of consent
Occupational Rehabilitation Program, Canadian Back Institute.

CBI *Physiotherapy & Rehabilitation Centre*

Providers of integrated rehabilitation solutions

Letter of Consent for Research Project
Occupational Rehabilitation 2 Program

I _____ have spoken to Marcy Leiva, Clinic Manager, CBI Physiotherapy & Rehabilitation Centre regarding a research project that is being conducted by Barry Ennis, Masters Degree candidate, University of Northern British Columbia. Individuals who are attending the Occupational Rehabilitation 2 Program, at CBI Physiotherapy & Rehabilitation Centre are eligible to participate in the study.

I _____ have authorized Ms. Leiva to provide my name and phone number to Barry Ennis. I understand that Barry Ennis will be contacting me and he will request to meet with me at CBI Physiotherapy & Rehabilitation Centre. He will provide me with further information about the study. I will have the option to participate in the study.

_____
Client's signature.

_____
Date.

_____
Witness

_____
Date

1310 - 5th Avenue, Prince George, British Columbia V2L 3L4
TEL: (250) 562-3537 FAX: (250) 562-3547 E-MAIL: princegeorge@cbi.ca WEBSITE: www.cbi.ca
A division of CBI Health

Appendix E

Post treatment return to work (RTW) outcome

Code number:____

Post treatment return to work (RTW) outcome

Referred to a case manager	Yes	No	
Returned to pre-injury job	(Graduated RTW)		
Returned to pre-injury job	Yes	Planned	No
Returned to modified job	Yes	Planned	No
No modified work available	Yes	No	
Is able to work, but no job available	Yes	No	
In training	Yes	No	
Looking for work	Yes	No	
Referred for vocational service	Yes	No	
Withdrew from RTW planning	Yes	No	
Tending house	Yes	No	
Retired	Yes	No	

Appendix F

Return to Work Self-Efficacy Scale

Code number:____

Return to Work Self-Efficacy Scale

This questionnaire is seeking information on how you judge your current circumstance. Please read each question and respond by drawing a circle around the number ranging from 0 to 100 % that reveals how you judge your capabilities. Following is a sample question, which I have judged myself on:

How certain are you that you can jump a 2 meters fence?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

Note that I have drawn a circle around 10% since I am very certain I cannot jump over a two meter fence under normal circumstances.

Please continue with the following questions and rate each question on how you judge yourself.

(PSE).

1. How certain are you that you can tolerate your current level of pain?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

2. How certain are you that you can continue with all of your daily activities (excluding work)?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

3. How certain are you that your pain will <u>not</u> interfere with your sleep?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

4. How certain are you that you can achieve a <u>small to moderate</u> reduction in your pain by using methods <u>other than taking extra medication</u>?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

5. How certain are you that you can make a large reduction in your pain by using methods other than taking extra medication?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

(FCS).

1. How certain are you that you can walk the same distance on flat ground as you could prior to your injury?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

2. How certain are you that you can lift the same amount of weight as you could prior to your injury?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

3. How certain are you that you can perform a daily home exercise program if one were prescribed?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

4. How certain are you that you can perform all of your household chores including maintaining your yard?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

5. How certain are you that you can shop for groceries, clothes, or other articles?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

6. How certain are you that you can engage in the same level of social activities as you did prior to your injury?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

7. How certain are you that you can engage in hobbies or recreational activities at the same level as prior to your injury?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

8. How certain are you that you can engage in the same level of family activities as you did prior to your injury?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

(WSE).

1. How certain are you that right now you can perform the work duties of your pre-injury job?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

2. How certain are you that you can return to full duties in your pre-injury job following treatment?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

3. How certain are you that you can do part of your pre-injury job following treatment?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

4. How certain are you can do a different kind of work?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

5. How certain are you that you can find another job?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

6. How certain are you of your ability to work full time after treatment?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

(CSE).

1. How certain are you that as your injuries heal you can control your fatigue?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

2. How certain are you that you can increase your activity level?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

3. How certain are you that you can do something to help yourself feel better when you are feeling blue or down?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

4. How certain are you that you can manage your pain during daily activities?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

5. How certain are you that you can manage your physical symptoms so that you can do the things you enjoy doing?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

6. How certain are you that you can cope with <u>mild to moderate</u> pain?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

7. How certain are you that you can cope with severe pain?

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100%

Thank you for your participation.

Appendix G

The SF-36 Health Survey

The SF-36™ Health Survey

Instructions for Completing the Questionnaire

Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

EXAMPLE

This is for your review. Do not answer this question. The questionnaire begins with the section ***Your Health in General*** below.

For each question you will be asked to fill in a bubble in each line:

1. How strongly do you agree or disagree with each of the following statements?

	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
a) I enjoy listening to music.	○	●	○	○	○
b) I enjoy reading magazines.	●	○	○	○	○

Please begin answering the questions now.

Your Health in General

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
○	○	○	○	○

2. **Compared to one year ago,** how would you rate your health in general now?

Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
○	○	○	○	○

Please turn the page and continue.

3. The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, Limited a lot	Yes, limited a little	No, not limited at all
a) **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	O	O	O
b) **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	O	O	O
c) Lifting or carrying groceries	O	O	O
d) Climbing **several** flights of stairs	O	O	O
e) Climbing **one** flight of stairs	O	O	O
f) Bending, kneeling, or stooping	O	O	O
g) Walking **more than a mile**	O	O	O
h) Walking **several blocks**	O	O	O
i) Walking **one block**	O	O	O
j) Bathing or dressing yourself	O	O	O

4. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	Yes	No
a) Cut down on the **amount of time** you spent on work or other activities	O	O
b) **Accomplished less** than you would like	O	O
c) Were limited in the **kind** of work or other activities	O	O
d) Had **difficulty** performing the work or other activities (for example, it took extra time)	O	O

5. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	Yes	No
a) Cut down on the **amount of time** you spent on work or other activities	O	O
b) **Accomplished less** than you would like	O	O
c) Didn't do work or other activities as **carefully** as usual	O	O

Please turn the page to continue.

6. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
○	○	○	○	○

7. How much bodily pain have you had during the **past 4 weeks**?

None	Very mild	Mild	Moderate	Severe	Very severe
○	○	○	○	○	○

8. During the **past 4 weeks**, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
○	○	○	○	○

9. These questions are about how you feel and how things have been with you during the **past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a) did you feel full of pep?	○	○	○	○	○	○
b) have you been a very nervous person?	○	○	○	○	○	○
c) have you felt so down in the dumps nothing could cheer you up?	○	○	○	○	○	○
d) have you felt calm and peaceful?	○	○	○	○	○	○
e) did you have a lot of energy?	○	○	○	○	○	○
f) have you felt downhearted and blue?	○	○	○	○	○	○
g) did you feel worn out?	○	○	○	○	○	○
h) have you been a happy person?	○	○	○	○	○	○
i) did you feel tired?	○	○	○	○	○	○

10. During the **past 4 weeks**, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
○	○	○	○	○

11. How TRUE or FALSE is each of the following statements for you?

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
a) I seem to get sick a little easier than other people	○	○	○	○	○
b) I am as healthy as anybody I know	○	○	○	○	○
c) I expect my health to get worse	○	○	○	○	○
d) My health is excellent	○	○	○	○	○

***THANK YOU* FOR COMPLETING THIS QUESTIONNAIRE!**

Appendix H

UNBC Ethics Board Approval Letter

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

RESEARCH ETHICS BOARD

MEMORANDUM

To: Barry Ennis

T Mothus

From: Alex Michalos, Chair
Research Ethics Board

Date: December 09, 2003

Re: Ethics Review E2003.1125.104
Work Self-efficacy of Individuals Injured on the Job

Thank you for submitting the above-noted proposal to the Research Ethics Board for review. Approval has been granted.

Good luck in your research.

Sincerely,

Alex Michalos, Chair
Research Ethics Board